

REMARKS

Applicant respectfully requests allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1, 3, 5-7, 24, 25, 28-30, 32-36, 38-42 and 44-45 are pending in the application, with claims 1, 24, 25, 28, 34 and 40 being independent. Claims 1, 5-7, 24, 25, 28, 34 and 40 have been amended. Claims 4, 31, 37 and 43 are canceled. Support for claim amendments and additions can be found in the original disclosure at least at page 17.

Claim Rejections under §112, Second Paragraph Rejection

Claims 1 is rejected under 35 U.S.C §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office asserts that “how Applicant is able to switch from series to parallel using only two fuel cells as claimed in claim 1 and the phrase “A fuel cell system configured to control temperature” in claim 1 renders the claim indefinite because it is unclear as to what this phrase encompasses, i.e. it is unclear to the examiner as to what Applicant’s temperature control is directed to.” Office Action, p. 2. For the sole purpose of expediting allowance and without conceding the propriety of the Office’s rejections, Applicant’s attorney has revised independent claim 1 as shown above. Accordingly, the Applicant respectfully requests that the Patent Office withdraw the rejection under 35 U.S.C. § 112, second paragraph.

Claim Rejections under §103(a)

Claims 1, 3-7, 24, 25 and 28-45 are rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent Publication No. 2003/0008184 A1 (hereinafter, “Ballantine”).

Applicant respectfully traverses these rejections. Nevertheless, for the sole purpose of expediting allowance and without conceding the propriety of the Office’s rejections, Applicant has amended independent claims 1, 24, 25, 28, 34 and 40.

Independent claim 1, as amended, recites a fuel cell system, configured to control temperature of individual fuel cells in a plurality of cells by regulating serial vs. parallel configuration of the plurality of fuel cells within the system, the system comprising:

- first and second fuel cells in the plurality of cells capable of providing an electrical output; and
- a controller configured for regulating temperature of the fuel cell system by controlling serial vs. parallel configuration of the first and second fuel cells, wherein the controller is configured to identify whether more or less heat is required by the fuel cell system,
- wherein the controller increases heat production by increasing fuel consumption by switching to a more serial configuration and decreases heat production by decreasing fuel consumption by switching to a more parallel configuration, and

- wherein the controller is in communication with:
 - a switch circuit comprising one or more switches for arranging the electrical output of the first fuel cell and the electrical output of the second fuel cell in parallel or series; and
 - a temperature measurement circuit capable of measuring the temperature of the first fuel cell or the second fuel cell and providing a signal to the controller;
 - wherein the controller utilizes the switch circuit to switch to a more serial configuration if more heat is required and switches to a more parallel configuration if less heat is required.

In making out a rejection of Applicant's claim 1, the Office states that Ballantine renders this claim obvious. Applicant respectfully disagrees. Nevertheless, Applicant has amended claim 1 for the sole purpose of expediting allowance.

Independent claim 1 is amended to recite that the fuel system is configured "to control temperature *of individual fuel cells in a plurality of cells* by regulating serial vs. parallel configuration of *the plurality of* fuel cells within the system." Independent claim 1 was further revised to recite that the controller "*increases heat production by increasing fuel consumption by switching to a more serial configuration and decreases heat production by decreasing fuel consumption by switching to a more parallel configuration.*"

Ballantine, meanwhile, describes “a cogeneration fuel system” that is “operated among various modes to balance heat and power demand signals. In general, a fuel cell system is coupled to a power sink and a heat sink, and a controller is adapted to respond to data signals from the power sink and the heat sink.” Ballantine, abstract.

The Ballantine reference discloses the use of serial vs. parallel configurations to regulate heat production. However, Ballantine describes a system where a parallel configuration creates *additional* heat—which is directly opposite to Applicant’s claim 1.

For instance, At the last lines of [0015], Ballantine discloses connecting fuel cells in parallel to respond to a demand for heat. At [0090], Ballantine discloses operating cells in parallel to produce more heat. Similarly, in paragraphs [0095], [0097], [0129], [0130] and the end of Claim 5, Ballantine uniformly discloses configuring a stack of cells in a parallel configuration to create additional heat. These references in Ballantine all point to creating a parallel configuration to *increase* or *provide* additional heat. Again, this is the opposite of what is claimed by Applicant.

Applicant’s Claim 1 recites that “the controller increases heat production by increasing fuel consumption by switching to a more serial configuration and decreases heat production by decreasing fuel consumption by switching to a more parallel configuration.” Claim 1 also recites that “the controller utilizes the switch circuit to switch to a more serial configuration if more heat is required and

switches to a more parallel configuration if less heat is required and maintaining a constant power output in each configuration.” The claim language makes it very clear that a “more parallel configuration” is used to “decrease heat production” instead of increasing heat production as disclosed in Ballantine.

The Office points to Ballantine at [0013] and [0130], and suggests that the elements of claim 1 are obvious with respect to Ballantine. However, Applicant respectfully disagrees, and instead submits that these and other passages directly teach away from Applicant’s claim.

Referring to [0013], Ballantine does not actually state which configuration, parallel or series, results in greater heat production. However, in the first several lines of [0130], Ballantine discloses use of a parallel configuration to create more heat energy. This disclosure is not what the Applicant recited in Claim 1, wherein Applicant recites using “the switch circuit to switch to a more serial configuration if more heat is required and switches to a more parallel configuration if less heat is required” and further recites “the controller increases heat production by increasing fuel consumption by switching to a more serial configuration and decreases heat production by decreasing fuel consumption by switching to a more parallel configuration.” Thus, Ballantine has failed to disclose that a serial configuration results in greater heat production, and in fact discloses the opposite.

As such, Applicant respectfully submits that Ballantine directly teaches away from Applicant’s claim. Accordingly, the Applicant respectfully requests that the § 103 rejection of claim 1 be removed and that claim be allowed to issue.

Dependent claims 3 and 5-7 depend from independent claim 1 and are allowable by virtue of their dependency from allowable claim 1, as well as for the additional features that each recites.

Independent claims 24, 25, 28, 34 and 40 have been amended to recite subject matter similar to amended independent claim 1. In making out a rejection of these claims, the Office states that Ballantine renders these claims obvious for reasons similar to those discussed above in regards to claim 1. Therefore, for at least reasons similar to those discussed above, Applicant respectfully submits that these claims stand allowable.

Each of **Dependent claims 29-30, 32-33, 35-36, 38-39, 41-42 and 44-45** depend from one of independent claims 28, 34 and 40, and are allowable by virtue of their dependency from an allowable base claim, as well as for the additional features that each recites.

Conclusion

All of the pending claims are in condition for allowance. Accordingly, Applicant requests a Notice of Allowability be issued forthwith. If the Office's next anticipated action is to be anything other than issuance of a Notice of Allowability, **Applicant respectfully requests a call to discuss any remaining issues.**

Respectfully Submitted,

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